Isoprene
Product Stewardship Summary
(CAS number 78-79-5)

Chemical Formula for Isoprene
C5H8

What is Isoprene?
Isoprene, also known as 2 Methyl-1,3 Butadiene, is a colourless volatile liquid. Isoprene is derived from the crude C5 stream (common name for IP-Feed) of a steam cracker by using an extractive distillation process.

How is Isoprene Used?
The polymerisation of isoprene using catalysts yields a synthetic rubber, polyisoprene, which closely resembles natural rubber. Polyisoprene is used in a wide variety of rubber applications including medical equipment, baby bottle teats/nipples, toys, shoe soles, tyres, and elastic films and threads for golf balls or textiles. It is also used in adhesives, paints and coatings.

Health, Safety and Environmental Considerations
Isoprene is extremely flammable and highly reactive in its liquid and vapour forms. This means that it can burn explosively and can also spontaneously 'polymerise'. Any environment where Isoprene is being used needs to be well ventilated. It should be kept away from heat and open flame. As the vapour is heavier than air, it may spread along the ground, so care needs to be taken that the vapour is not ignited by a distant source.

Isoprene is a static accumulator. Even with proper grounding and bonding, this material can still accumulate an electric charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Prior to handling, persons need to be thoroughly trained to recognize and safely manage all aspects of the risks associated with static electricity.

Prolonged contact with the substance can cause irritant effects to skin and eyes and inhaling it in high concentrations can cause dizziness and headache.

Isoprene is classified as a possible human carcinogen by the International Agency for Research on Cancer (IARC); in Europe, it is classified as a category 2 carcinogen and category 3 mutagen. These classifications are based on the results of animal studies as no such effects have been observed in humans.
Isoprene is toxic to the environment and not readily biodegradable. However, in view of its high tendency to evaporate from water, it is not expected to pose a hazard to aquatic organisms.

Storing and Transporting Isoprene

Isoprene should be stored in mild steel or stainless-steel tanks. Isoprene is transported by tank truck, rail car and vessel/barge. Isoprene is extremely flammable and can accumulate static electricity during transfer; therefore precautionary measures to prevent static discharge must be taken. To prevent peroxide formation, which could lead to uncontrolled polymerisation when the product is transported or stored, another chemical is added to stabilise isoprene, and it is stored under a non-flammable (inert) gas.

Risk Characterization Summary

Risks associated with exposure to this product have been evaluated for the following “chain-of-commerce” activities: manufacture, storage, product transfer, transportation, and customers/markets. Due to health, safety and environmental considerations, it is only manufactured, stored and transported to customers in closed systems. Likewise, customers are limited to those who only use the product in closed systems as an intermediate for the manufacture of other chemicals. Proper equipment design and handling procedures maintain low risk from exposure to the product where the product is used as a chemical intermediate.

This product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the chemical’s applicable Safety Data Sheet, which should be consulted before use of the chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

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